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# **Alcohol Involvement in Fatal Motor Vehicle Traffic Crashes, 2003**

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16. Abstract  Alcohol related fatalities are defined as fatalities that occur in crashes where at least one driver or non-occupant (pedestrian or pedal-cyclist) involved in the crash has a positive Blood Alcohol Concentration (BAC) value.  This report presents estimates of alcohol involvement in fatal traffic crashes that occurred during 2003. The data are abstracted from the Fatality Analysis Reporting System (FARS) and represent a combination of actual Blood Alcohol Concentration (BAC) test results and estimated BAC distributions when the BAC test results are not available. Estimates of alcohol involvement have been presented along various categories of interest like Driver Age, Gender and crash characteristics like rural/urban, single-vehicle/multiple vehicle crash comparisons. Descriptive measures like the mean and median BAC values are provided. Also, continuous BAC distributions are provided for each of the categories.			
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## Executive Summary

In 2003, a total of 38,252 fatal motor vehicle traffic crashes were recorded in the United States that accounted for 42,643 fatalities. Of these crashes, an estimated 40 percent were **alcohol-related**, i.e., at least one driver, pedestrian or pedalcyclist had a Blood Alcohol Concentration (BAC) of 0.01 grams per deciliter (g/dl) or greater. Alcohol-related crashes accounted for about 40 percent of all **fatalities** in traffic crashes.

About 25 percent of all **drivers** involved in fatal crashes had alcohol, i.e., their BAC was 0.01 or greater (0.01+).

In crashes involving at least one driver/motorcycle operator with alcohol, about 82 percent of the fatalities occurred to the impaired driver/motorcycle operator or to persons riding with them.

One thousand, three hundred and fifty one (1,351) motorcycle operators with alcohol were involved in fatal crashes. There were 1,386 fatalities in such crashes. About 90 percent of the fatalities in crashes involving at least one motorcycle operator with alcohol occurred those motorcycle operators with alcohol.

About three-fourths, or 6,935 drivers, of all fatally injured drivers with alcohol were also unrestrained, i.e., they were not using safety belts/motorcycle helmets.

About 43 percent of the fatally injured drivers with alcohol were also speeding. This compares to 23 percent of the fatally injured drivers with no alcohol who were also speeding.

The median age of drivers involved in fatal crashes who had alcohol is lower than that of drivers without alcohol. The median age of drivers involved in fatal crashes with alcohol is 32 as compared to 39 for drivers involved in fatal crashes without alcohol.

More than two-thirds of drivers involved in fatal crashes with one or more previous DWI convictions had alcohol. While 3 percent of all drivers involved in fatal crashes were known to have a previous DWI conviction, close to 8 percent of the drivers who had alcohol also had a previous DWI conviction. Also, among the recidivistic drivers with alcohol, more than 90 percent were intoxicated (BAC=0.08+).

About 37 percent of all drivers involved in fatal crashes who had any alcohol were also involved in a rollover crash as compared to 15 percent of drivers who were involved in a rollover crash and did not have any alcohol.

Fatally injured passengers who were riding with a driver with alcohol were likely to be in the same age group as the driver.

About 36 percent of all non-occupants who died in traffic crashes had alcohol (BAC=0.01+).



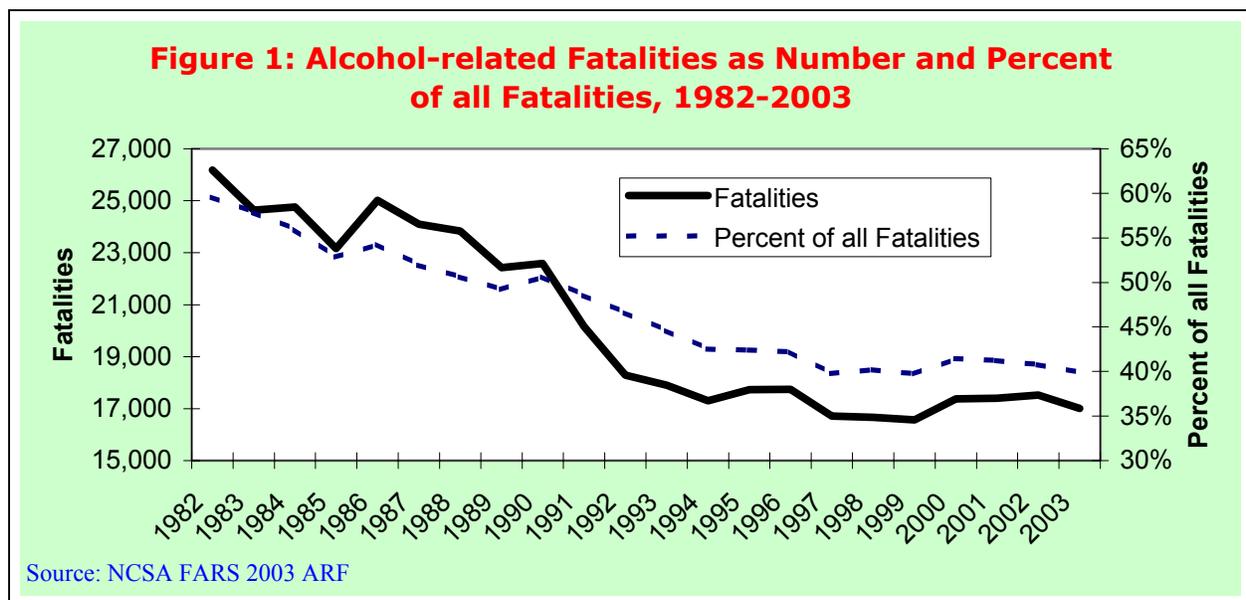
# 1. Introduction

This report presents statistics on the extent of alcohol involvement in fatal motor vehicle traffic crashes in the United States for 2003. The data presented in this report are from the 2003 Fatality Analysis Reporting System (FARS) Annual Report File (ARF). The data represent a combination of actual Blood Alcohol Concentration (BAC) test results and estimated<sup>1</sup> BAC values for those drivers and non-occupants (pedestrians and pedal-cyclists) for whom BAC test results are not reported.

A motor vehicle traffic crash is considered to be *alcohol-related* if at least one driver or non-occupant (such as a pedestrian or pedal-cyclist) involved in the crash is determined to have had a BAC of 0.01 gram per deciliter (g/dl) or higher. Thus, any fatality that occurs in an alcohol-related crash is considered an alcohol-related fatality. The term “alcohol-related” does not indicate that a crash or fatality was caused by the presence of alcohol. A motor vehicle traffic crash can be identified as an alcohol-related crash under one of the following scenarios:

- Drivers are the only persons with alcohol (BAC=0.01+).
- Non-occupants (pedestrians or pedal-cyclists) are the only persons with alcohol.
- Both a driver(s) and a non-occupant(s) have alcohol.

In 2003, NHTSA reported that 15,251 fatal crashes were alcohol-related. There were 17,013 fatalities, or about 40 percent of all fatalities, in such crashes. This was the first year since 1999 when alcohol-related fatalities showed a decline from the previous year. Figure 1 depicts the trend of alcohol-related fatalities, as number and percent of all fatalities, since 1982 -- the first year when NHTSA reported estimates of alcohol involvement in fatal crashes.



<sup>1</sup> The estimates are made using Multiple Imputation - a new model developed by the National Highway Traffic Safety Administration (Rubin, [2]; Subramanian, [3])

Table 1 summarizes the alcohol-related fatal crashes and fatalities in 2003 by the highest BAC level in the crash (among drivers and non-occupants).

<b>Table 1: Alcohol-Related Crashes and Fatalities by Highest BAC in the Crash, 2003</b>								
Crashes/ Fatalities	Highest BAC Level in Crash							
	Not Alcohol-Related		Alcohol-Related					
	0.00		0.01 – 0.07		0.08+		Total (Alc-Rel)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Crashes	23,001	60%	2,115	6%	13,136	34%	15,251	40%
Fatalities	25,630	60%	2,383	6%	14,630	34%	17,013	40%

Source: NCSA FARS 2003 (ARF). Note: Numbers and Percentages may not add to total due to independent rounding.

About 40 percent of all motor vehicle fatal crashes/fatalities are alcohol-related. A majority, about 86 percent [13,136/15251], of the alcohol-related crashes involved at least one driver or non-occupant with a BAC of 0.08 or above. Table 2 depicts the crashes shown in Table 1 by the role of the person(s) who had alcohol and the *highest* BAC level of those persons. The *highest* BAC level is the highest BAC of the persons of the same role who are involved in the same crash. The breakdown in fatal crashes in Table 1 does not add up to 15,251, as some crashes do not have at least one coded driver or non-occupant in them.

<b>Table 2: Alcohol-Related Crashes by Role of Person with Alcohol, 2003</b>						
Role of Non-Sober Person	Highest BAC Level of Person					
	0.01 – 0.07		0.08+		Total (Alc-Rel)	
	Crashes	Percent	Crashes	Percent	Crashes	Percent
Driver Only <sup>1</sup>	1,924	13%	11,235	74%	13,159	86%
Non-occupant Only <sup>2</sup>	174	1%	1,432	9%	1,606	11%
Driver and Non-occupant <sup>3</sup>	13	0%	442	3%	454	3%
Others <sup>4</sup>	4	0%	27	0%	31	0%
<b>Total</b>	<b>2,115</b>	<b>14%</b>	<b>13,136</b>	<b>86%</b>	<b>15,251</b>	<b>100%</b>

Source: NCSA FARS 2003 (ARF). Note: Numbers and Percentages may not add to total due to independent rounding.

<sup>1</sup>Drivers were the only persons to have alcohol. No non-occupant had alcohol

<sup>2</sup>Non-occupants were the only persons to have alcohol. No drivers had alcohol

<sup>3</sup>At least one driver and one non-occupant involved in crash had alcohol.

<sup>4</sup>Residual alcohol-related crashes that do not have any coded driver or non-occupant in them.

As seen in Table 2, in a majority (about 86 percent) of the alcohol-related fatal crashes, one or more drivers had a BAC of 0.01 or above, and those crashes did not involve a non-occupant with a positive BAC. In a small proportion, about 11 percent (1,606 crashes), of all alcohol-related fatal crashes, the only person(s) with alcohol was a non-occupant(s). The remaining crashes, about 3 percent of all alcohol-related fatal crashes, involved both a driver as well as a non-occupant with positive BAC.

In about three-quarters of all alcohol-related crashes, the driver, while the only person with alcohol in the crash, also had a BAC of 0.08 or above (11,235 out of 15,251 fatal crashes).

Table 3 depicts the fatalities that occurred in the crashes as described in Table 2.

<b>Table 3: Alcohol-Related Fatalities by Role of Person with Alcohol, 2003</b>						
Role of Non-Sober Person	Highest BAC Level of Person					
	0.01 – 0.07		0.08+		Total (Alc-Rel)	
	Fatalities	Percent	Fatalities	Percent	Fatalities	Percent
Driver Only <sup>1</sup>	2,183	13%	12,661	75%	14,844	87%
Non-occupant Only <sup>2</sup>	180	1%	1,468	9%	1,647	10%
Driver and Non-occupant <sup>3</sup>	14	0%	464	3%	478	3%
Others <sup>4</sup>	7	0%	37	0%	44	0%
<b>Total</b>	<b>2,383</b>	<b>14%</b>	<b>14,630</b>	<b>86%</b>	<b>17,013</b>	<b>100%</b>

Source: NCSA FARS 2003 (ARF). Note: Numbers and Percentages may not add to total due to independent rounding.

<sup>1</sup>Drivers were the only persons to have alcohol. No non-occupant had alcohol

<sup>2</sup>Non-occupants were the only persons to have alcohol. No drivers had alcohol

<sup>3</sup>At least one driver and one non-occupant involved in crash had alcohol.

<sup>4</sup>Residual alcohol-related fatalities that occurred in crashes which do not have any coded driver or non-occupant in them.

The percentages depicted in Table 3 show a high correlation with those for the crashes, as depicted in Table 2. Table 4 depicts the proportion of drivers, motorcycle operators and non-occupants with alcohol. As shown in Table 4, a total of 58,156 drivers/motorcycle operators were involved in fatal crashes in 2003. Among the drivers, 12,909 or 24 percent had alcohol, whereas 1,351 or 36 percent of the motorcycle operators had alcohol. Also, 23,258 drivers were fatally injured and 8,406 of those had alcohol. Among the 3,382 fatally injured motorcycle operators, 1,243 had alcohol. A greater proportion of motorcycle operators involved in fatal crashes had alcohol as compared to drivers of other vehicles and non-occupants.

**Table 4: Drivers/Motorcycle Operators Involved in Fatal Crashes by their BAC and Injury Severity, 2003**

Role	Injury Severity						Total		
	FATAL			SURVIVED					
	Total	BAC=0.01+		Total	BAC=0.01+		Total	BAC=0.01+	
	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent
<b>Drivers</b>	23,258	8,406	36%	31,149	4,503	14%	54,407	12,909	24%
<b>Motorcycle Operators</b>	3,382	1,243	37%	367	108	29%	3,749	1,351	36%
<b>Total</b>	26,640	9,649	36%	31,516	4,611	15%	58,156	14,260	25%
<b>Non-Occupants</b>	5,450	1,964	36%	564	182	32%	6,014	2,146	36%
<b>All</b>	32,090	11,613	36%	32,080	4,793	15%	64,170	16,406	26%

Source: NCSA FARS 2003 (ARF). Note: Numbers and Percentages may not add to total due to independent rounding.

## 2. Alcohol-Related Fatalities

This section describes fatalities that occurred in alcohol-related crashes. Of interest are the roles of the fatally injured persons and the vehicles they were traveling in.

### 2.1. Alcohol-Related Fatalities by Role

In 2003, there were 17,013 fatalities in the 15,251 fatal crashes that were alcohol-related. Table 5 identifies the alcohol involvement of the fatally injured persons. For drivers, motorcycle operators and non-occupants, the fatalities are classified by their alcohol involvement and for passengers/riders, the fatalities are classified by the alcohol involvement of the drivers/motorcycle operators with whom they were riding.

<b>Table 5: Fatalities in Alcohol-Related Crashes by Role and Alcohol Involvement<sup>1</sup>, 2003</b>		
<b>Role</b>	<b>Number</b>	<b>Percent</b>
Driver <b>with</b> alcohol	8,406	49.4%
Passengers riding w/ Driver <b>with</b> alcohol	2,896	17.0%
Motorcycle Operator <b>with</b> alcohol	1,243	7.3%
Motorcycle Rider w/ Operator <b>with</b> alcohol	110	0.7%
Non-occupant <b>with</b> alcohol	1,964	11.5%
Driver <b>with no</b> alcohol	1,036	6.1%
Passengers w/ Driver <b>with no</b> alcohol	583	3.4%
Motorcycle Operator <b>with no</b> alcohol	136	0.8%
Motorcycle Rider w/ Operator <b>with no</b> alcohol	14	0.1%
Non-occupant <b>with no</b> alcohol	555	3.3%
Others <sup>2</sup>	70	0.4%
<b>Total</b>	<b>17,013</b>	<b>100%</b>

<sup>1</sup>BAC is reported in FARS only for Drivers, Pedestrians and Pedalcyclists  
<sup>2</sup>Includes Occupant of Motor Vehicle Not in Transport/ Occupant of a Non Motor Vehicle Transport Device or Unknown Occupant in Motor Vehicle in Transport or Passengers in Vehicles without a Coded Driver.  
 Source: NCSA FARS 2003 Annual Report File  
 Note: Numbers and Percentages may not add to total due to independent rounding.

As seen in Table 5, more than two-thirds of all persons killed in alcohol-related crashes were drivers, motorcycle operators and non-occupants who themselves had alcohol. Another 18 percent of all alcohol-related fatalities were persons who were riding with drivers/motorcycle operators who had alcohol. Drivers, motorcycle operators, and non-occupants with no alcohol as well as passengers riding with drivers/motorcycle operators with no alcohol accounted for about 14 percent of all alcohol-related fatalities.

As motor vehicle traffic crashes are usually complex events, it would be noteworthy to identify the role and alcohol involvement of the fatally injured persons, conditional on the fact that one or more persons of a particular role had alcohol in the crash.

### 2.1.1. Fatalities in Crashes in which at Least one of the Involved Drivers/Motorcycle Operators had alcohol

As shown previously in Table 4, there were 14,260 drivers/motorcycle operators with alcohol who were involved in fatal crashes. There were 15,322 fatalities in such crashes. Table 6 depicts the fatalities by the role of the fatally injured person and the alcohol involvement of drivers, motorcycle operators and non-occupants killed in the crash.

In crashes involving at least one driver/motorcycle operator with alcohol, about 82 percent of the fatalities occurred to the impaired driver/motorcycle operator or to persons riding with them. The remaining fatalities in such crashes occurred to drivers/motorcycle operators with no alcohol (multiple vehicle crashes), passengers riding with such drivers/motorcycle operators and non-occupants. The main difference between Table 6 and Table 5 is in the smaller number of fatally injured non-occupants with alcohol that is reflected in Table 6.

<b>Table 6: Fatalities in Crashes Involving at least one Driver/Motorcycle Operator with alcohol, by Role and Alcohol Involvement<sup>1</sup>, 2003</b>		
<b>Role</b>	<b>Number</b>	<b>Percent</b>
Driver <b>with</b> alcohol	8,406	54.9%
Passengers riding w/ Driver <b>with</b> alcohol	2,896	18.9%
Motorcycle Operator <b>with</b> alcohol	1,243	8.1%
Motorcycle Rider w/ Operator <b>with</b> alcohol	110	0.7%
Non-occupant <b>with</b> alcohol	422	2.8%
Driver <b>with no</b> alcohol	1,020	6.7%
Passengers w/ Driver <b>with no</b> alcohol	579	3.8%
Motorcycle Operator <b>with no</b> alcohol	133	0.9%
Motorcycle Rider w/ Operator <b>with no</b> alcohol	14	0.1%
Non-occupant <b>with no</b> alcohol	475	3.1%
Others <sup>2</sup>	24	0.2%
<b>Total</b>	<b>15,322</b>	<b>100%</b>

<sup>1</sup>BAC is reported in FARS only for Drivers, Pedestrians and Pedal-cyclists.  
<sup>2</sup>Includes Occupant of Motor Vehicle Not in Transport/ Occupant of a Non Motor Vehicle Transport Device or Unknown Occupant in Motor Vehicle in Transport or Passengers in Vehicles without a Coded Driver.  
Source: NCSA FARS 2003 Annual Report File  
Note: Numbers and Percentages may not add to total due to independent rounding.

## 2.1.2. Fatalities in Crashes in which at Least one of the Involved Motorcycle Operators had alcohol

As shown previously in Table 5, there were 1,243 motorcycle operators with alcohol who were fatally injured. There were 1,386 fatalities in crashes that involve at least one motorcycle operator with alcohol. Table 7 shows the fatalities by the role of the fatally injured person in such crashes. About 90 percent of the fatalities in crashes involving at least one motorcycle operator with alcohol occurred to those motorcycle operators with alcohol. Further, 8 percent of the fatalities in such crashes occurred to riders who were riding with the operators who had alcohol.

<b>Table 7: Fatalities in Crashes Involving at least one Motorcycle Operator with alcohol, by Role and Alcohol Involvement<sup>1</sup>, 2003</b>		
Role	Number	Percent
Driver <b>with</b> alcohol	3	0.3%
Motorcycle Operator <b>with</b> alcohol	1,243	89.7%
Motorcycle Rider w/ Operator <b>with</b> alcohol	110	8.0%
Non-occupant <b>with</b> alcohol	2	0.1%
Driver <b>with no</b> alcohol	4	0.3%
Passengers w/ Driver <b>with no</b> alcohol	2	0.2%
Motorcycle Operator <b>with no</b> alcohol	18	1.3%
Motorcycle Rider w/ Operator <b>with no</b> alcohol	2	0.2%
Non-occupant <b>with no</b> alcohol	1	0.1%
Total	1,386	100%

<sup>1</sup>BAC is reported in FARS only for Drivers, Pedestrians and Pedal-cyclists.  
Source: NCSA FARS 2003 Annual Report File  
Note: Numbers and Percentages may not add to total due to independent rounding.

### 2.1.3. Fatalities in Crashes in which at Least one of the Involved Non-Occupants had alcohol

There were 2,146 non-occupants with alcohol who were involved in fatal crashes, as previously depicted in Table 5. There were 2,126 fatalities in such crashes. Table 8 depicts the fatalities by the role of the fatally injured person. In crashes that involved at least one non-occupant with alcohol, more than 90 percent of the fatalities occurred to the non-occupants who had alcohol.

<b>Table 8: Fatalities in Crashes Involving at least one Non-Occupant with alcohol, by Role and Alcohol Involvement<sup>1</sup>, 2003</b>		
Role	Number	Percent
Driver <b>with</b> alcohol	13	0.6%
Passengers riding w/ Driver <b>with</b> alcohol	5	0.3%
Motorcycle Operator <b>with</b> alcohol	3	0.1%
Motorcycle Rider w/ Operator <b>with</b> alcohol	1	0.1%
<b>Non-occupant with alcohol</b>	<b>1964</b>	<b>92.4%</b>
Driver <b>with no</b> alcohol	17	0.8%
Passengers w/ Driver <b>with no</b> alcohol	5	0.2%
Motorcycle Operator <b>with no</b> alcohol	3	0.1%
Motorcycle Rider w/ Operator <b>with no</b> alcohol	1	0.1%
Non-occupant <b>with no</b> alcohol	112	5.3%
Others <sup>2</sup>	4	0.2%
<b>Total</b>	<b>2,126</b>	<b>100%</b>

<sup>1</sup>BAC is reported in FARS only for Drivers, Pedestrians and Pedalcyclists)  
<sup>2</sup>Includes Occupant of Motor Vehicle Not in Transport/ Occupant of a Non Motor Vehicle Transport Device or Unknown Occupant in Motor Vehicle in Transport or Passengers in Vehicles without a Coded Driver.  
 Source: NCSA FARS 2003 Annual Report File  
 Note: Numbers and Percentages may not add to total due to independent rounding.

The data in this section points out the fact that majority of the persons killed in alcohol-related crashes are the persons with alcohol. The following section will deal more with the characteristics of the impaired driver/motorcycle operator and non-occupants in greater detail.

## 2.2. Alcohol-Related Fatalities by Vehicle Type and Role

This section will describe the fatalities that occurred to vehicle occupants in alcohol-related crashes by the type of the vehicle in which they were riding. Of particular interest are the vehicle-type, the impairment status of the driver and the passengers who were riding with them.

Table 9 depicts the fatally injured occupants by vehicle-type in alcohol-related crashes in 2003.

**Table 9: Vehicle Occupants Fatally Injured in Alcohol-Related Crashes by Type of Vehicle and Alcohol Involvement, 2003**

Vehicle Type	Driver with Alcohol		Passengers Riding w/ Driver with Alcohol		Driver with no Alcohol		Passengers Riding w/ Driver with no Alcohol		Total
	Number	%	Number	%	Number	%	Number	%	
<b>Passenger Cars</b>	4,607	62%	1,781	24%	973	9%	371	5%	7,455
<b>Vans</b>	300	50%	147	25%	79	13%	64	11%	595
<b>SUVs</b>	1,137	66%	414	24%	98	6%	74	4%	1,729
<b>Pickups</b>	2,078	75%	498	18%	138	5%	58	2%	2,779
<b>Large Trucks</b>	42	52%	10	13%	24	30%	2	3%	78
<b>Total Occupants*</b>	8,406	65%	2,896	22%	1,020	8%	579	5%	12,921
<b>Motorcycles</b>	1,243	83%	110	7%	136	9%	14	1%	1,505

Source: NCSA FARS 2003 ARF

Individual components do not add up to the total as there are Unknown/Other Vehicle categories not shown here.

Note: Numbers and Percentages may not add to total due to independent rounding.

As seen in Table 9, overall among all occupants of vehicles, about 65 percent of the fatalities occurred to drivers of these vehicles who themselves had alcohol. About 22 percent of the fatalities occurred to passengers who were riding with the drivers who had alcohol. This is true for occupants of passenger cars and SUVs. About 75 percent of all pickup truck occupant fatalities in alcohol-related crashes occurred to the drivers who had alcohol. This is reflective of the low occupancy levels of pickup trucks. Among motorcyclists, about 83 percent of the persons killed in alcohol-related crashes were the operators who themselves had alcohol.

### 3. The Driver/Motorcycle Operator who had Alcohol

In 2003, there were 14,260 drivers/motorcycle operators involved in fatal crashes who had alcohol. Of these drivers/motorcycle operators, two-thirds or 9,649 were fatally injured.

#### 3.1 Driver / Behavioral Factors

This section will highlight some of the driver-related and behavioral characteristics of the drivers/motorcycle operators who had alcohol. The factors analyzed are restraint use of the driver, speeding, recidivism and age of the drivers/motorcycle operators.

##### 3.1.1 Restraint Use

The use of restraints (safety belts and motorcycle helmets) and severity of injuries of drivers involved in fatal crashes by their alcohol involvement is depicted in Table 10.

<b>Table 10: Drivers/Motorcycle Operators Involved in Fatal Crashes by Injury Severity, Alcohol Involvement and Restraint Use, 2003</b>						
Injury Severity	Unrestrained		Restrained		Total	
	Number	Percent	Number	Percent	Number	Percent
<b>Drivers with Alcohol</b>						
Survived	1,863	40%	2,748	60%	4,611	100%
Fatally Injured	6,935	72%	2,714	28%	9,649	100%
Total	8,797	62%	5,463	38%	14,260	100%
<b>Drivers with no Alcohol</b>						
Survived	3,632	14%	23,273	86%	26,905	100%
Fatally Injured	7,636	45%	9,355	55%	16,991	100%
Total	11,269	26%	32,627	74%	43,896	100%
Source: NCSA FARS 2003 ARF						
Note: Totals may not equal previously reported totals as occupants whose restraint use was coded as "Unknown" were prorated between the restraint used and unused categories. The pro-rated fatality counts have been rounded to the nearest integer.						
Note: Numbers and Percentages may not add to total due to independent rounding.						

About 72 percent (or 6,935 drivers) of all fatally injured drivers with alcohol were unrestrained, i.e., they were not using safety belts/motorcycle helmets. This compares to 45 percent (or 7,636 drivers) of all fatally injured drivers who had no alcohol and were unrestrained. Among all drivers with alcohol, about 62 percent were unrestrained while only 26 percent of the drivers with no alcohol were unrestrained.

### 3.1.2 Speeding

Annually, about 32 percent of all motor vehicle traffic fatalities occur in crashes that are speeding-related, i.e., at least one of the drivers involved in the crash exceeded the posted speed limit or was driving too fast for the prevailing conditions. Table 11 shows drivers/motorcycle operators involved in fatal crashes classified by alcohol involvement and whether the driver was cited for speeding. As seen in Table 11, 43 percent of the fatally injured drivers with alcohol were also speeding. This compares to 23 percent of the fatally injured drivers with no alcohol who were also speeding. Also, 91 percent of the surviving drivers with no alcohol were not speeding as compared to 69 percent of the surviving drivers with alcohol.

<b>Table 11: Drivers/Motorcycle Operators Involved in Fatal Crashes by Injury Severity, Alcohol Involvement and Speeding, 2003</b>						
Injury Severity	Speeding		Not Speeding		Total	
	Number	Percent	Number	Percent	Number	Percent
<b>Drivers with Alcohol</b>						
Survived	1,412	31%	3,200	69%	4,611	100%
Fatally Injured	4,177	43%	5,473	57%	9,649	100%
Total	5,588	39%	8,672	61%	14,260	100%
<b>Drivers with no Alcohol</b>						
Survived	2,536	9%	24,370	91%	26,905	100%
Fatally Injured	3,827	23%	13,163	77%	16,991	100%
Total	6,363	14%	37,533	86%	43,896	100%
Source: NCSA FARS 2003 ARF						
Note: Totals may not equal previously reported totals as occupants whose restraint use was coded as "Unknown" were prorated between the restraint used and unused categories. The pro-rated fatality counts have been rounded to the nearest integer.						
Note: Numbers and Percentages may not add to total due to independent rounding.						

### 3.1.3 Age of the Driver

In 2003, as a proportion of all drivers involved in fatal crashes for a given age, drivers who were 21 years of age had the highest percentage with alcohol at 39 percent. Figure 2 depicts the distribution of this percentage with age.

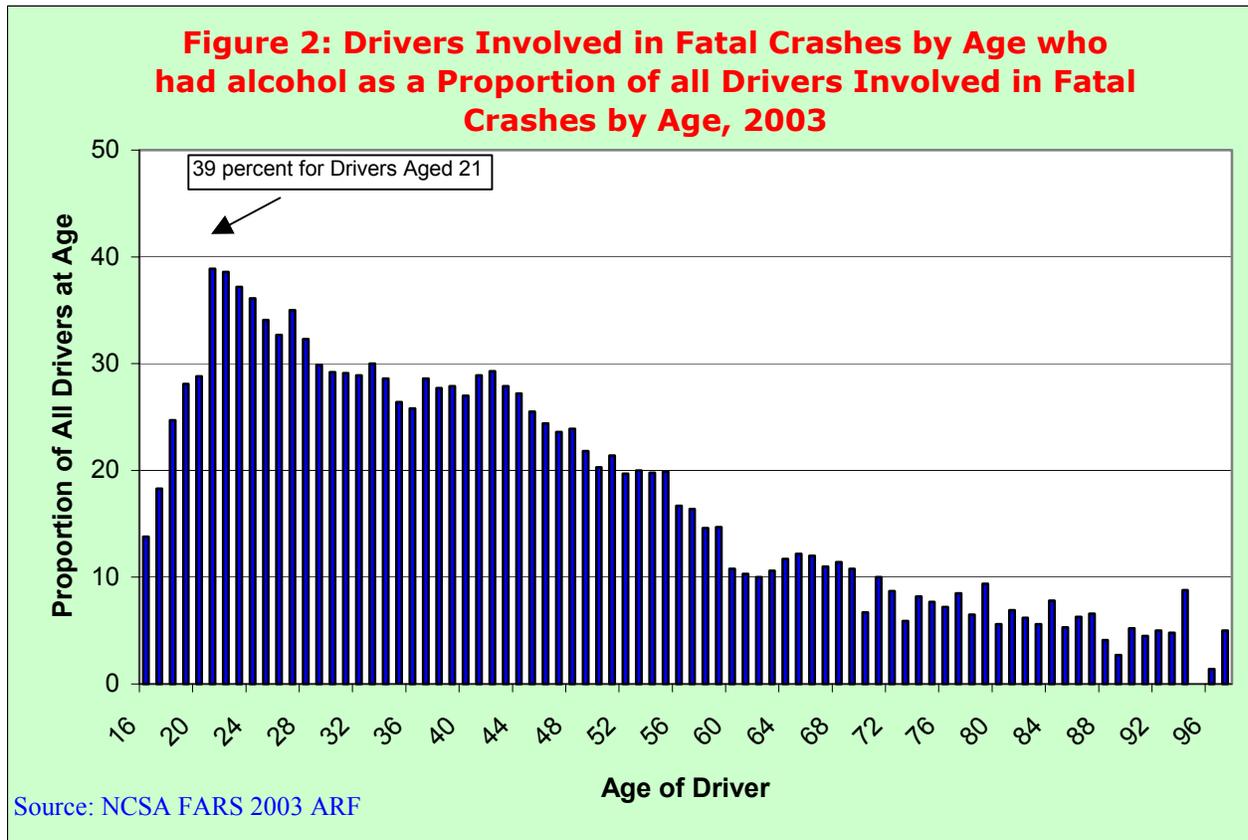


Table 12 depicts the average and median ages among drivers involved in fatal crashes by their alcohol involvement. The median, average, 25<sup>th</sup> percentile and 75<sup>th</sup> percentile age of drivers involved in fatal crashes who had alcohol are lower than those of drivers involved without alcohol. The median age of drivers involved in fatal crashes who had alcohol is 32 as compared to 39 for drivers involved in fatal crashes who did not have alcohol. Thus, of drivers involved in fatal crashes, drivers who had alcohol are younger overall than drivers who had no alcohol. As shown in Table 13, of drivers involved in fatal

Quartile	Age of Driver	
	Alcohol Involved	Not Alcohol Involved
25 <sup>th</sup> Percentile	23	25
Average Age	35	42
Median Age	32	39
75 <sup>th</sup> Percentile	44	54

Source: NCSA FARS 2003 ARF  
Note: Numbers and Percentages may not add to total due to independent rounding.

crashes, those of ages 21-24 were most likely to be intoxicated, followed by drivers aged 25 to 34.

**Table 13: Alcohol Involvement among Drivers Involved in Fatal Crashes by Age, 2003**

Driver's Age	Total		No Alcohol		BAC =0.01-0.07		BAC =0.08+		BAC=0.01+	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>16-20</b>	7,693	100%	5,859	76%	388	5%	1,446	19%	1,834	24%
<b>21-24</b>	6,234	100%	3,879	62%	345	6%	2,010	32%	2,355	38%
<b>25-34</b>	11,218	100%	7,734	69%	501	5%	2,983	27%	3,485	31%
<b>35-44</b>	10,967	100%	7,932	72%	424	4%	2,611	24%	3,035	28%
<b>45-64</b>	14,379	100%	11,615	81%	440	3%	2,324	16%	2,764	19%
<b>65+</b>	6,388	100%	5,866	92%	122	2%	400	6%	522	8%
<b>Unknown</b>	1,277	100%	1,011	79%	44	3%	222	17%	266	21%
<b>Total</b>	58,156	100%	43,896	76%	2,264	4%	11,996	21%	14,260	25%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

As seen in Table 13, alcohol involvement among drivers involved in fatal crashes is the highest for drivers aged 21-24. In fact, about 38 percent of all drivers involved in fatal crashes in this age group had some alcohol. Drivers 65 years of age and older had the least extent of alcohol involvement. Also, less than 9 percent of all drivers aged 65 years of age and older had some alcohol.

Table 14 depicts the extent of alcohol involvement among drivers in fatal crashes by age.

<b>Table 14: Distribution of BAC of Drivers with Alcohol Involved in Fatal Crashes by the Age of the Driver, 2003</b>				
Driver Age	25 <sup>th</sup> Percentile	Average BAC	Median BAC	75 <sup>th</sup> Percentile
16-20	0.08	0.14	0.14	0.19
21-24	0.10	0.16	0.15	0.20
25-34	0.11	0.16	0.16	0.21
35-44	0.11	0.17	0.17	0.23
45-64	0.10	0.17	0.16	0.22
65+	0.08	0.15	0.14	0.20

Source: NCSA FARS 2003 ARF  
Note: Numbers and Percentages may not add to total due to independent rounding.

The average BAC is the lowest among drivers aged 16-20, followed by drivers above 65 years of age. The highest median BAC is for drivers aged 35-44.

### 3.1.4 Recidivism (Repeat Offenses)

Recidivism, with respect to impaired driving, is coded in FARS in terms of the number of *prior DWI (Driving While Intoxicated)* convictions in the previous three years for the driver. Table 15 presents the extent of alcohol involvement among drivers with prior DWI convictions (Recidivistic) and those with no prior DWI convictions.

<b>Table 15: Distribution of Age of Drivers Involved in Fatal Crashes by their Alcohol Involvement, 2003</b>						
Drivers Involved in Fatal Crashes	TOTAL		BAC=0.01+		BAC=0.08+	
	Number	Percent	Number	Percent	Number	Percent
<b>Prior DWI Convictions</b>						
<b>None</b>	54,304	100%	12,581	23%	10,511	19%
<b>Yes (Recidivistic)</b>	1,670	100%	1,103	66%	1,005	60%
<b>Unknown</b>	2,182	100%	576	26%	480	22%
<b>Total</b>	58,156	100%	14,260	25%	11,996	21%

Source: NCSA FARS 2003 ARF  
Note: Numbers and Percentages may not add to total due to independent rounding.

In 2003, two-thirds of drivers who had prior DWI convictions and were involved in fatal crashes had alcohol. While 3 percent [1,670/58,156] of all drivers involved in fatal crashes were known to have a previous DWI conviction, close to 8 percent [1,103/14,260] of the drivers who had alcohol were also found to have had a previous DWI conviction. In addition, among the recidivistic drivers with alcohol, more than 90 percent [1,005/1,103] were intoxicated (BAC=0.08+). This seems to indicate that there is a high likelihood that drivers involved in fatal crashes who had a prior DWI conviction will have had alcohol. Table 16 summarizes the number of drivers with one or more prior DWI convictions who were involved in fatal crashes.

<b>Table 16: Alcohol-Related Fatal Crashes and Number of Fatalities Involving one or more Drivers with Prior DWI Convictions who had alcohol, 2003</b>			
Crashes/Fatalities	Alcohol-Related		
	TOTAL	Involving one or more Drivers with Prior DWI Conviction who had alcohol	% of Total
<b>Crashes</b>	15,251	1,100	7.2%
<b>Fatalities</b>	17,013	1,240	7.3%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

Figure 3 depicts the distribution of BAC levels among drivers involved in fatal crashes given recidivism status. The percentages shown in Figure 3 are the number of drivers at that BAC level as a proportion of all drivers who had any alcohol. The relative frequencies differ from each other in that for drivers with one or more prior DWI convictions, the distribution is skewed to the right. This indicates that recidivistic drivers involved in fatal crashes tend to have more alcohol (higher BAC) as compared to drivers with no previous DWI convictions.

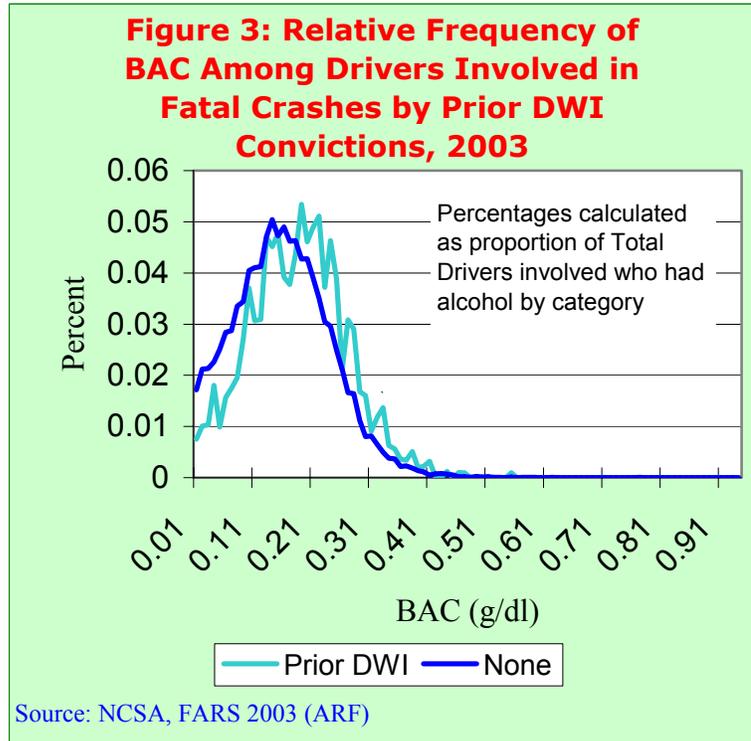


Table 17 further illustrates this difference by providing the descriptive statistics on BAC for the two groups of drivers. Table 17 shows that when drivers with previous DWI convictions have alcohol, the BAC level is higher than those drivers with no prior DWI convictions. In fact, the median BAC among recidivistic drivers is 0.19 g/dl -- 0.03 g/dl above the median BAC for the non-recidivistic drivers.

**Table 17: Distribution of BAC of Drivers with Alcohol Involved in Fatal Crashes by Prior DWI Convictions, 2003**

Quartile	BAC (g/dl)	
	Driver with one or more previous DWI Convictions	Driver with no Prior DWI Convictions
25 <sup>th</sup> Percentile	0.13	0.10
Average BAC	0.19	0.16
Median BAC	0.19	0.16
75 <sup>th</sup> Percentile	0.24	0.21

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

## 3.2 Vehicle-Related Factors

This section will highlight some of the vehicle-related factors that are correlated with impaired drivers/motorcycle operators. Of interest is the occurrence of rollover crashes by the type of vehicles that were being driven by the impaired driver.

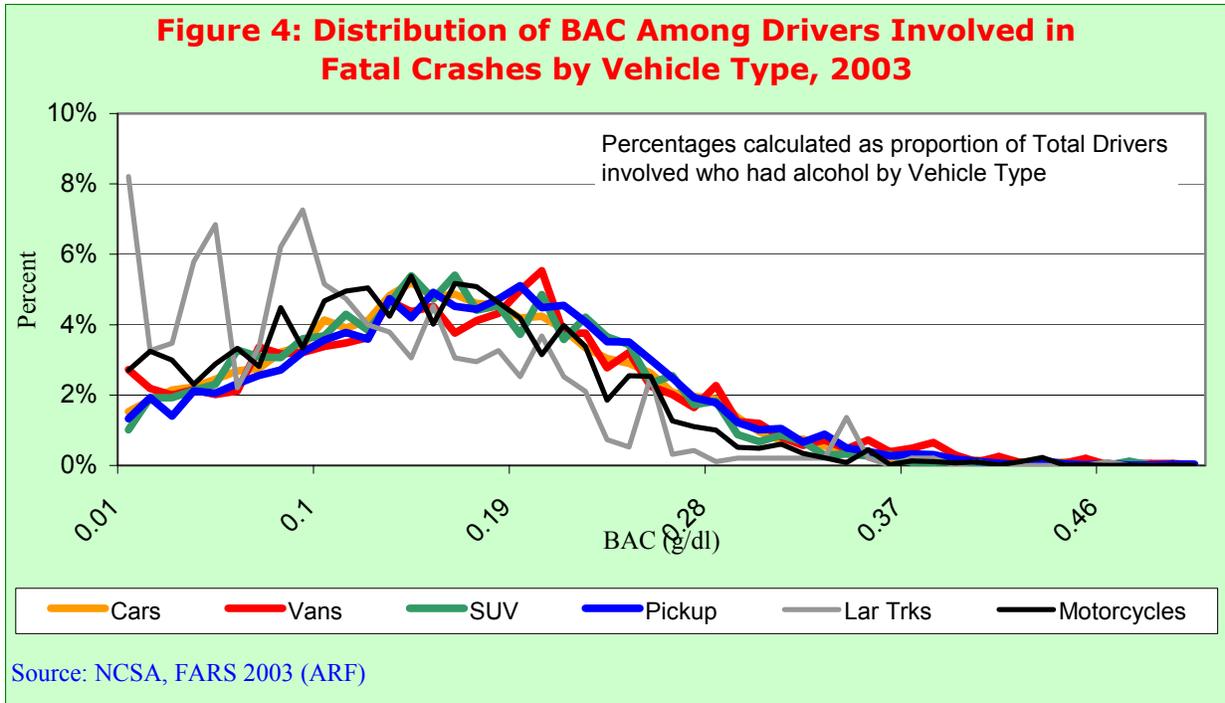
### 3.2.1 Alcohol Involvement among drivers by Vehicle Type

Table 18 depicts the proportion of drivers involved who had alcohol by the type of vehicle they were driving.

<b>Table 18: Alcohol Involvement among Drivers Involved in Fatal Crashes by Type of Vehicle, 2003</b>					
<b>Vehicle Type</b>	<b>BAC = 0.01+</b>		<b>BAC = 0.08+</b>		<b>Total</b>
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>
<b>Passenger Cars</b>	6,817	26%	5,749	22%	26,030
<b>Vans</b>	595	16%	497	13%	3,688
<b>SUVs</b>	1,814	25%	1,530	21%	7,195
<b>Pickups</b>	3,164	29%	2,730	25%	10,955
<b>Other/Unk LTV</b>	9	9%	7	7%	106
<b>Large Trucks</b>	95	2%	64	1%	4,608
<b>Motorcycles</b>	1,351	36%	1,077	29%	3,749
<b>Buses</b>	15	5%	11	4%	288
<b>Other Vehicles</b>	187	31%	155	26%	604
<b>Unknown Vehicles</b>	213	23%	176	19%	933
<b>Total</b>	14,260	25%	11,996	21%	58,156

Source: NCSA FARS 2003 ARF  
 Note: Numbers and Percentages may not add to total due to independent rounding.

As a proportion of drivers involved in fatal crashes, motorcycle riders had the highest number who had alcohol at 36 percent. This compares to 26 percent for drivers of passenger cars, 25 percent for drivers of SUVs, 29 percent for drivers of pickup trucks and 16 percent for the drivers of vans. A similar trend was observed for the proportion of drivers who were intoxicated (BAC=0.08+). Figure 4 depicts the distribution of BAC, conditional on driver having a positive BAC, by the type of vehicle.



As seen in Figure 4, the distribution of BAC among drivers with alcohol involved in fatal crashes is almost the same for all passenger vehicles while that for drivers of Large Trucks is skewed to the left. This implies that when drivers of large trucks are found to have alcohol, the alcohol level is less than those for drivers of passenger vehicles and motorcycles.

Table 19 further illustrates this difference by providing the univariate measures on BAC between the drivers by the type of vehicle they were driving.

**Table 19: Distribution of BAC of Drivers with Alcohol Involved in Fatal Crashes by the Type of Vehicle, 2003**

Vehicle Type	25 <sup>th</sup> Percentile	Average BAC	Median BAC	75 <sup>th</sup> Percentile
Passenger Car	0.10	0.16	0.16	0.21
Vans	0.10	0.17	0.16	0.22
SUV	0.10	0.16	0.16	0.21
Pickup Trucks	0.11	0.17	0.17	0.22
Large Trucks	0.05	0.12	0.10	0.17
Motorcycles	0.09	0.14	0.14	0.20

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

As shown in Table 19, the median BAC level among drivers with alcohol involved in fatal crashes was the highest for drivers of pickup trucks (0.17 g/dl) and the lowest for drivers of large trucks (0.10 g/dl). Motorcycle operators, when they had any alcohol, had lower median and average BAC levels as compared to drivers of passenger vehicles.

### 3.2.2 Rollover

Rollover crashes are complex events that can be driver, vehicle or environment-related. Driving under the influence of alcohol could be one of the significant driver-related factors that can contribute to rollover of a vehicle. Table 20 illustrates this by depicting the extent of rollover between drivers of passenger vehicles involved in fatal crashes who had any alcohol and those who had no alcohol.

<b>Table 20: Drivers of Passenger Vehicles Involved in Fatal Crashes by Alcohol Involvement and Rollover Occurrence, 2003</b>						
<b>Rollover Occurrence</b>	<b>No Alcohol</b>		<b>Alcohol</b>		<b>Total</b>	
	Number	Percent	Number	Percent	Number	Percent
<b>No Rollover</b>	30,095	85%	7,809	63%	37,904	79%
<b>Rollover</b>	5,480	15%	4,590	37%	10,070	21%
<b>Total</b>	35,576	100%	12,399	100%	47,974	100%

Source: NCSA FARS 2003 ARF  
 Note: Numbers and Percentages may not add to total due to independent rounding.

As seen in Table 20, 37 percent of all drivers who had any alcohol were also involved in a rollover crash as compared to 15 percent of drivers who did not have any alcohol.

### 3.3 Environment-Related Factors

This section will highlight some of the environment-related factors that are correlated with impaired drivers/motorcycle operators. Of interest is the extent of alcohol involvement by the time of the day, day of the week, location (rural/urban), etc.

#### 3.3.1 Alcohol Involvement among Drivers by Time of the Day

Table 21 depicts the extent of alcohol involvement among drivers involved in fatal crashes by the time of the day (day/night). A driver involved in a fatal crash during nighttime is about four times more likely to have alcohol as compared to a driver involved in a daytime fatal crash. Daytime crashes have been defined here as crashes that occur between 6 am and 5:59 pm. Crashes that occur between 6 pm and 5:59 am are defined as nighttime crashes.

<b>Table 21: Drivers Involved in Fatal Crashes by their Alcohol Involvement and Time of the Day, 2003</b>						
<b>Time of Day</b>	<b>Total</b>		<b>BAC=0.01+</b>		<b>BAC=0.08+</b>	
	Number	Percent	Number	Percent	Number	Percent
<b>Day</b>	31,659	100%	3,215	10%	2,481	8%
<b>Night</b>	26,102	100%	10,811	41%	9,313	36%
<b>Unknown</b>	395	100%	235	59%	203	51%
<b>Total</b>	58,156	100%	14,260	25%	11,996	21%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

Table 22 disaggregates the alcohol involvement among drivers involved in nighttime crashes by the time period.

<b>Table 22: Drivers Involved in Nighttime Fatal Crashes by their Alcohol Involvement, 2003</b>						
<b>Time of Day</b>	<b>Total</b>		<b>BAC=0.01+</b>		<b>BAC=0.08+</b>	
	Number	Percent	Number	Percent	Number	Percent
<b>6 - 9 PM</b>	8,770	100%	2,413	28%	1,996	23%
<b>9 - Midnight</b>	7,424	100%	3,019	41%	2,600	35%
<b>Midnight - 3 AM</b>	6,013	100%	3,644	61%	3,226	54%
<b>3 - 6 AM</b>	3,895	100%	1,734	45%	1,490	38%
<b>Total</b>	26,102	100%	10,811	41%	9,313	36%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

About 61 percent of the drivers involved in fatal crashes between midnight and 3 am had alcohol as compared to only 28 percent of the drivers involved in crashes between 6 pm and 9 pm. More than 40 percent of drivers involved in crashes between 9 pm to midnight and between 3 am and 6 am had alcohol.

It is clear from the data that drivers involved in fatal, nighttime crashes are more likely to have alcohol as compared to drivers involved in daytime crashes. In fact, more than three-fourths of drivers who had alcohol were those involved in nighttime crashes.

### 3.3.2 Alcohol Involvement among Drivers by Day of the Week

Table 23 presents data on the extent of alcohol involvement among drivers involved in fatal crashes by the day of the week, i.e., a weekday or a weekend and the time of the day.

<b>Table 23: Drivers Involved in Fatal Crashes by their Alcohol Involvement, Time of the Day and the Day of the Week 2003</b>							
<b>Day of the Week and Time of the Day</b>		<b>Total</b>		<b>BAC=0.01+</b>		<b>BAC=0.08+</b>	
		<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
<b>Weekday</b>	<b>Daytime</b>	22,807	100%	1,817	8%	1,390	6%
	<b>6 - 9 PM</b>	4,383	100%	1,004	23%	816	19%
	<b>9 - Midnight</b>	3,514	100%	1,316	37%	1,150	33%
	<b>Midnight -3 AM</b>	2,330	100%	1,325	57%	1,178	51%
	<b>3 - 6 AM</b>	1,766	100%	577	33%	497	28%
	<b>Unknown</b>	118	100%	54	46%	45	38%
	<b>Total</b>	34,918	100%	6,092	17%	5,076	15%
<b>Weekend</b>	<b>Daytime</b>	8,852	100%	1,398	16%	1,091	12%
	<b>6 - 9 PM</b>	4,387	100%	1,409	32%	1,180	27%
	<b>9 - Midnight</b>	3,910	100%	1,704	44%	1,451	37%
	<b>Midnight -3 AM</b>	3,683	100%	2,319	63%	2,048	56%
	<b>3 - 6 AM</b>	2,129	100%	1,158	54%	993	47%
	<b>Unknown</b>	168	100%	120	71%	106	63%
	<b>Total</b>	23,129	100%	8,108	35%	6,869	30%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

Overall, 17 percent of all drivers involved in a fatal crash during a weekday had alcohol as compared to 35 percent of those who were involved in a crash during the weekend. Irrespective

of if it was a weekday or a weekend, the time period between midnight and 3 am involved the highest proportion of drivers who had alcohol. About sixty-three percent of drivers in weekend crashes between 12 am and 3 am had alcohol as compared to 57 percent of the drivers in the same time period during weekdays. Also for the time period between 3 am and 6 am, if the crash occurred on a weekend, an involved driver is more likely to have alcohol as compared to drivers in crashes that occurred during the same time-period during a weekday.

### 3.3.2 Alcohol Involvement among Drivers by Location (Rural or Urban)

Table 24 presents data on the extent of alcohol involvement among drivers involved in fatal crashes by the location of the crash, i.e., if it occurred in a rural or an urban area.

<b>Table 24: Drivers Involved in Fatal Crashes by their Alcohol Involvement and Location, 2003</b>						
<b>Location</b>	<b>Total</b>		<b>BAC = 0.01+</b>		<b>BAC = 0.08+</b>	
	Number	Percent	Number	Percent	Number	Percent
<b>Rural</b>	33,448	100%	8,449	25%	7,120	21%
<b>Urban</b>	24,246	100%	5,716	24%	4,799	20%
<b>Unknown</b>	462	100%	96	21%	78	17%
<b>Total</b>	58,156	100%	14,260	25%	11,996	21%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

The extent of drivers who had alcohol does not differ significantly if the crash occurred on a rural or urban location. For both locations, about 25 percent of the drivers involved in fatal crashes had alcohol. The distributions are very similar for the two classes of drivers.

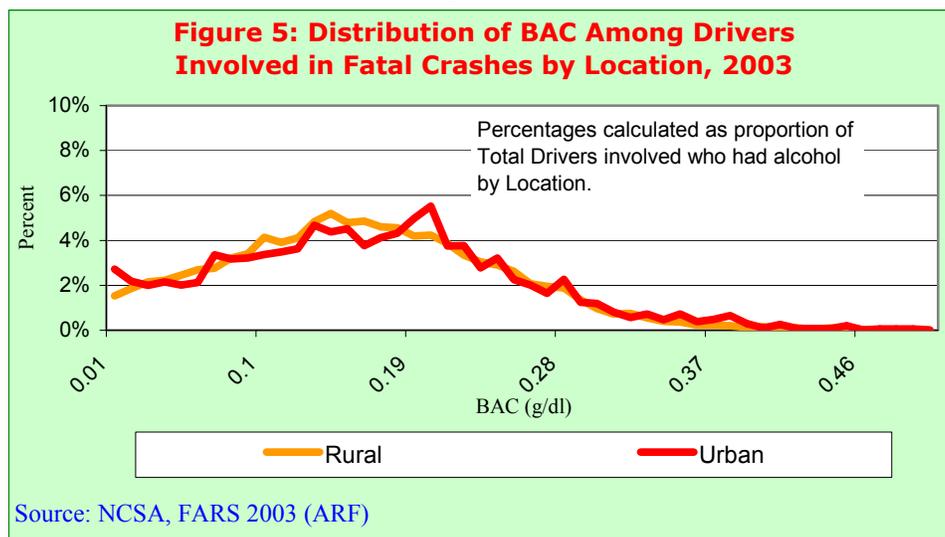


Table 25 further illustrates this lack of significant difference by providing the univariate measures on BAC between the drivers by location.

<b>Table 25: Distribution of BAC of Drivers Involved in Fatal Crashes with Alcohol by Location, 2003</b>				
Location	25 <sup>th</sup> Percentile	Average BAC	Median BAC	75 <sup>th</sup> Percentile
Rural	0.10	0.16	0.16	0.22
Urban	0.10	0.16	0.15	0.21

Source: NCSA FARS 2003 ARF  
 Note: Numbers and Percentages may not add to total due to independent rounding.

As shown in Table 25, the median BAC level among drivers involved in fatal crashes was marginally higher for drivers involved in rural areas (0.16 g/dl) as compared to drivers involved in fatal crashes in urban areas (0.15 g/dl).

## 4. Fatally Injured Passengers/Motorcycle Riders

This section will analyze the characteristics of passengers/motorcycle riders killed in alcohol-related crashes in 2003. Alcohol test results for passengers are not reported to FARS in most of the cases, and hence, the alcohol involvement of the passengers cannot be determined.

Table 26 depicts passengers/motorcycle riders killed in alcohol-related crashes in 2003. About 80 percent of the fatalities occurred to passengers who were riding with an impaired driver.

<b>Table 26: Passengers/Motorcycle Riders Killed in Alcohol-Related Crashes, 2003</b>		
Role	Number	Percent
Passengers riding w/ Driver <b>with</b> alcohol	2,896	79.2%
Motorcycle Rider w/ Operator <b>with</b> alcohol	110	3.0%
Passengers w/ Driver <b>with no</b> alcohol	583	16.0%
Motorcycle Rider w/ Operator <b>with no</b> alcohol	14	0.4%
Others	52	1.4%
Total	3,655	100%
Source: NCSA FARS 2003 Annual Report File		
Note: Numbers and Percentages may not add to total due to independent rounding.		

Of particular interest are the characteristics of the 2,896 passengers who were fatally injured and were riding with a driver who had alcohol. Table 27 depicts the restraint use among passengers killed in alcohol-related crashes by the alcohol involvement of the driver with whom they were riding.

<b>Table 27: Passengers killed in Alcohol-Related Crashes by their Restraint Use and Alcohol Involvement of the Driver they were Riding with, 2003</b>						
Alcohol Involvement of Driver	Unrestrained		Restrained		Total	
	Number	Percent	Number	Percent	Number	Percent
Riding with Driver who had alcohol	2,207	76%	689	24%	2,896	100%
Riding with Driver with no alcohol	299	51%	284	49%	583	100%
Source: NCSA FARS 2003 ARF						
Note: Totals may not equal previously reported totals as occupants whose restraint use was coded as "Unknown" were prorated between the restraint used and unused categories. The pro-rated fatality counts have been rounded to the nearest integer.						
Note: Numbers and Percentages may not add to total due to independent rounding.						

The data in Table 27 show that among passengers killed in alcohol-related crashes, they are more likely to be unrestrained if they were riding with a driver who had alcohol as compared to when they were riding with a driver with no alcohol. About three-fourths of all passengers killed when they were riding with a driver who had alcohol were unrestrained. This compares to slightly more than half of unrestrained passengers killed riding with a driver with no alcohol.

## 4.1 Age of Passengers

This section will provide data on the age of the passengers killed in alcohol-related crashes and identify any correlations between the age of the driver they were riding with. Table 28 depicts the age of the passengers killed in alcohol-related crashes by the alcohol involvement of the driver they were riding with.

<b>Table 28: Passengers Killed in Alcohol-Related Crashes by their Age and the Alcohol Involvement of the Driver they were Riding with, 2003</b>				
Age-group	Riding with Drivers who had alcohol		Riding with Drivers who had no alcohol	
	Fatalities	Percent	Fatalities	Percent
Under 1	13	0.4%	13	2.3%
1-3	39	1.3%	18	3.1%
4-7	42	1.5%	30	5.2%
8-15	171	5.9%	68	11.7%
16-20	735	25.4%	78	13.3%
21-24	542	18.7%	59	10.0%
25-34	585	20.2%	69	11.8%
35-44	382	13.2%	54	9.3%
45-64	281	9.7%	104	17.9%
65+	93	3.2%	86	14.8%
Unknown	14	0.5%	4	0.6%
<b>Total</b>	<b>2,896</b>	<b>100%</b>	<b>583</b>	<b>100%</b>

Source: NCSA FARS 2003 Annual Report File  
 Note: Numbers and Percentages may not add to total due to independent rounding.

There were 735 passengers aged 16-20 who were killed when they were riding with a driver who had alcohol. This was about a quarter of all passengers killed when they were riding with a driver who had alcohol. However, passengers who were killed in alcohol-related crashes but were riding with a driver with no alcohol tended to be older passengers, with 45 to 64-year-olds having the highest number (104) of passenger fatalities.

Table 29 (next page) depicts the age of the fatally injured passengers by the age of the driver with whom they were riding in cases where the driver had alcohol. As the highlighted diagonal cells in Table 29 indicate, fatally injured passengers were most likely to be in vehicles driven by drivers of the same age range who had alcohol. As shown in Table 29, 450 passengers aged 16-20 years were killed when they were riding with a 16 to 20-year-old driver who had alcohol. This represents about two-thirds [450/711] of all fatalities to 16 to 20-year-olds when they were riding with a driver who had alcohol.

**Table 29: Age of Driver by Age of Fatally Injured Passengers when they were traveling with a driver who had alcohol, 2003**

Age of Driver	Age of Passenger ( <i>Italicized numbers are percentages</i> )											Total
	< 1	1-3	4-7	8-15	16-20	21-24	25-34	35-44	45-64	65+	Unk	
<b>8-15</b>	1 <i>4.6</i>	1 <i>I</i>	0 -	10 <i>48</i>	7 <i>32</i>	0 -	0 -	1 <i>6</i>	0 -	0 -	0 -	22
<b>16-20</b>	3 <i>0.4</i>	5 <i>0.8</i>	1 <i>0.1</i>	72 <i>10.1</i>	450 <i>63.4</i>	106 <i>14.9</i>	42 <i>6.0</i>	20 <i>2.8</i>	10 <i>1.3</i>	2 <i>0.2</i>	2 <i>0.3</i>	711
<b>21-24</b>	4 <i>0.5</i>	7 <i>1.0</i>	5 <i>0.7</i>	24 <i>3.3</i>	180 <i>24.8</i>	268 <i>36.8</i>	176 <i>24.1</i>	41 <i>5.6</i>	19 <i>2.6</i>	3 <i>0.4</i>	3 <i>0.4</i>	728
<b>25-34</b>	2 <i>0.3</i>	16 <i>2.4</i>	21 <i>3.2</i>	26 <i>3.9</i>	58 <i>8.6</i>	133 <i>19.7</i>	252 <i>37.3</i>	99 <i>14.7</i>	55 <i>8.2</i>	8 <i>1.2</i>	5 <i>0.7</i>	675
<b>35-44</b>	3 <i>0.8</i>	8 <i>1.9</i>	11 <i>2.8</i>	27 <i>6.6</i>	23 <i>5.7</i>	20 <i>4.8</i>	76 <i>18.7</i>	150 <i>37.1</i>	71 <i>17.6</i>	16 <i>3.8</i>	1 <i>0.3</i>	404
<b>45-64</b>	0 <i>0.0</i>	1 <i>0.4</i>	3 <i>1.3</i>	9 <i>3.3</i>	11 <i>3.9</i>	8 <i>2.8</i>	30 <i>10.9</i>	66 <i>24.3</i>	109 <i>39.9</i>	34 <i>12.5</i>	2 <i>0.8</i>	273
<b>65+</b>	0 -	0 -	0 -	0 -	0 -	0 -	2 <i>4.1</i>	2 <i>3.2</i>	15 <i>28.9</i>	31 <i>60.0</i>	1 <i>2.0</i>	51
<b>Unknwn</b>	0 -	0 -	0 -	3 <i>9.6</i>	5 <i>16.8</i>	9 <i>26.4</i>	7 <i>22.7</i>	4 <i>13.0</i>	3 <i>7.8</i>	1 <i>1.6</i>	1 <i>1.6</i>	32
<b>Total</b>	13	39	42	171	735	542	585	382	281	93	14	2,896

Source: NCSA FARS 2003 ARF

Individual cell counts do not add up to total due to independent rounding. Percentages are calculated based on unrounded estimates and will hence differ from those calculated based on displayed cell counts.

Note: Numbers and Percentages may not add to total due to independent rounding.

## 5. Fatally Injured Children (Under 16)

As shown in Table 30, a total of 2,570 children under the age of 16 were fatally injured in motor vehicle traffic crashes in 2003. About 22 percent of them (552/2,570) were killed in alcohol-related crashes. A large proportion of these fatalities occurred in crashes where the highest BAC in the crash was 0.08 or higher.

<b>Table 30: Children (Under 16) Killed in Fatal Crashes by Age and Highest BAC in Crash, 2003</b>									
<b>Age</b>	<b>Total</b>	<b>BAC=0</b>		<b>0.01-0.07</b>		<b>BAC=0.08+</b>		<b>Alcohol-Related</b>	
	<b>Num</b>	<b>Num</b>	<b>Percent</b>	<b>Num</b>	<b>Percent</b>	<b>Num</b>	<b>Percent</b>	<b>Num</b>	<b>Percent</b>
<b>Under 1</b>	130	102	79%	3	2%	25	19%	28	22%
<b>1-3</b>	364	294	81%	9	3%	60	17%	70	19%
<b>4-7</b>	472	385	82%	17	4%	70	15%	87	18%
<b>8-15</b>	1,604	1,236	77%	75	5%	293	18%	368	23%
<b>Total</b>	2,570	2,018	79%	104	4%	448	17%	552	22%

Source: NCSA FARS 2003 ARF. Note: Numbers and Percentages may not add to total due to independent rounding.

Table 31 depicts the role of the 552 children fatally injured in alcohol-related crashes. Almost three-fourths of children killed in alcohol-related crashes were passengers, 20 percent were non-occupants and 7 percent were drivers.

<b>Table 31: Role of Children Killed in Alcohol-Related Crashes, 2003</b>		
<b>Role</b>	<b>Fatalities</b>	<b>%</b>
<b>Driver</b>	41	7.4%
<b>Passenger</b>	401	72.6%
<b>Non-occupant</b>	110	19.9%
<b>Total</b>	552	100%

Source: NCSA FARS 2003 ARF

Table 32 depicts the alcohol involvement of the drivers with whom the 401 fatally injured children were riding.

As seen in Table 32, about two-thirds of the children killed in alcohol-related crashes were riding with a driver who had alcohol.

<b>Table 32: Children who are Passengers Killed in Alcohol-Related Crashes by the Alcohol Involvement of Driver, 2003</b>		
<b>Role</b>	<b>Fatalities</b>	<b>%</b>
Riding w/ Driver who had Alcohol	264	65.8%
Riding w/ Driver who had no alcohol	130	32.4%
Others*	8	2.0%
<b>Total</b>	<b>401</b>	<b>100%</b>
*Motorcycle Riders, etc. Source: NCSA FARS 2003 ARF		

## 5. Fatally Injured Non-occupants

Table 33 depicts the role of the non-occupants, who were killed in alcohol-related crashes, i.e., if they were a pedestrian, pedal-cyclist or other type of non-motorists. As seen previously in Table 2, about 11 percent of all alcohol-related crashes in 2003 involved a non-occupant who was the only person in the crash to have alcohol. There were 6,014 non-occupants involved in fatal crashes of which 2,416 had some alcohol. There were 5,450 fatally injured non-occupants of which 1,964 had some alcohol. There were also 555 non-occupants with no alcohol who were killed in alcohol-related crashes (a driver/motorcycle operator involved in the crash had alcohol). Summarizing, a total of 2,519 non-occupants were killed in alcohol-related crashes and 1,964 of them had some alcohol.

<b>Table 33: Non-occupants killed in alcohol-related crashes by Role, 2003</b>					
<b>Person Type</b>	<b>Total</b>	<b>Not Alcohol-Related</b>		<b>Alcohol-Related</b>	
	<b>Num</b>	<b>Num</b>	<b>Percent</b>	<b>Num</b>	<b>Percent</b>
<b>Pedestrian</b>	4,749	2,496	52.6%	2,253	47.4%
<b>Bicyclist</b>	619	381	61.6%	238	38.4%
<b>Other Cyclist</b>	3	3	90.0%	0	10.0%
<b>Othr/Unk Ped</b>	78	51	65.4%	27	34.6%
<b>Unk Non-Motorist</b>	1	1	60.0%	0	40.0%
<b>Total</b>	5,450	2,931	53.8%	2,519	46.2%

Source: NCSA FARS 2003 ARF  
 Note: Numbers and Percentages may not add to total due to independent rounding.

About 46 percent of all non-occupant fatalities occurred in alcohol-related crashes in 2003. About 90 percent [2,253/2,519] of the non-occupant fatalities in alcohol-related crashes occurred to pedestrians. The remainder of this section will depict the characteristics of pedestrians killed in alcohol-related crashes.

### 5.1 Pedestrians killed in Alcohol-Related Crashes

In 2003, there were 2,253 pedestrian fatalities in alcohol-related crashes. Some of these pedestrians had alcohol, while the others who did not have alcohol were killed in crashes that involved a driver with alcohol. Table 34 depicts the alcohol involvement of the pedestrians killed in alcohol-related crashes by the type of the crash, i.e., if it was a single-vehicle or multiple vehicle crash.

**Table 34: Pedestrians Killed in Alcohol-Related Crashes by Crash Type and Alcohol Involvement, 2003**

Type of Crash	Pedestrian's Alcohol Involvement		Total
	Alcohol Involved	Not Alcohol Involved	
Frequency Table Percent Row Pct Col Pct			
<b>Single Vehicle</b>	1,616 71.68% 80.25% 91.10%	398 17.64% 19.75% 82.75%	2,014 89.32%
<b>Multiple Vehicle</b>	158 7.00% 65.57% 8.90%	81 3.68% 34.43% 17.25%	241 10.7%
<b>Total</b>	1,774 78.68%	479 21.32%	2,253 100%

Source: NCSA FARS 2003 ARF  
 Note: Numbers and Percentages may not add to total due to independent rounding.

As seen in Table 34, about 79 percent of the pedestrians killed in alcohol-related crashes themselves had alcohol. About 90 percent of the pedestrian fatalities in alcohol-related crashes occurred in single-vehicle crashes. Table 35 depicts the general location (rural or urban) of the single-vehicle crashes in which the 2,014 pedestrians were fatally injured.

<b>Table 35: Pedestrians Killed in Single-Vehicle Alcohol-Related Crashes by their Alcohol Involvement and Roadway Function Class, 2003</b>				
<b>Alcohol Involvement</b>	<b>Roadway Function Class</b>			<b>Total</b>
<b>Frequency Col Pct</b>	<b>Rural</b>	<b>Urban</b>	<b>Unknown</b>	
<b>Alcohol Involved</b>	489 30.3%	1,114 68.9%	13 0.8%	1,616 100%
<b>Not Alcohol Involved</b>	112 28.1%	286 71.8%	1 0.1%	398 100%
<b>Total</b>	601 29.9%	1,399 69.5%	14 0.7%	2,014 100%

Source: NCSA FARS 2003 ARF

As depicted in Table 35, about 70 percent [1,399/2,014] of the pedestrians killed in single-vehicle alcohol-related crashes were in urban locations. This is true irrespective of whether the pedestrian had alcohol or not. Furthermore, close to 80 percent [1,114/1,399] of pedestrians killed in urban, single-vehicle alcohol-related crashes themselves had alcohol.

Table 36 depicts the time of the day (day or night) of the single-vehicle alcohol-related crashes in which the 2,014 pedestrians were fatally injured.

<b>Table 36: Pedestrians Killed in Single-Vehicle Alcohol-Related Crashes by their Alcohol Involvement and Time of the Day, 2003</b>				
<b>Alcohol Involvement</b>	<b>Time Of the Day</b>			<b>Total</b>
<b>Frequency Col Pct</b>	<b>Day</b>	<b>Night</b>	<b>Unknown</b>	
<b>Alcohol Involved</b>	170 10.5%	1,433 88.6%	13 0.8%	1,616 100%
<b>Not Alcohol Involved</b>	100 25.2%	296 74.3%	2 0.5%	398 100%
<b>Total</b>	270 13.4%	1,728 85.8%	15.3 0.8%	2,014 100%

Source: NCSA FARS 2003 ARF

As shown in Table 36, about 86 percent [1,728/2,014] of the pedestrians killed in single-vehicle alcohol-related crashes that occurred during the nighttime. This increased to 89 percent [1,433/1,616] among pedestrians who themselves had alcohol.

## 6. Conclusions

About 40 percent of all motor vehicle traffic crash fatalities in the U.S. in 2003 occurred in crashes that were alcohol-related (BAC of 0.01 or above). This is the first decrease in alcohol-related fatalities since 1999, at which point these fatalities began to increase.

Although alcohol involvement cannot be interpreted as a direct causal relationship between alcohol use and any other attribute of fatal crashes, it does provide insight into the extent of impaired driving along various categories that are of interest to those involved in policy-making and directing impaired-driving countermeasures.

The analyses presented in this report show that a majority (86 percent) of the persons killed in alcohol-related crashes themselves had alcohol or were riding in a vehicle driven by a person with alcohol.

Higher alcohol involvement was observed among drivers who were involved in single-vehicle crashes, nighttime crashes and weekend crashes, as well as those drivers who had a prior DWI conviction.

Also, passengers killed in alcohol-related crashes who were riding with a driver with alcohol were most likely to be in the same age range as the driver.

About three-fourths of children (under 16) killed in alcohol-related crashes were passengers in a vehicle. Of those, about two-thirds were riding in a vehicle in which the driver had alcohol.

A majority of the alcohol-related crashes that killed pedestrians were single-vehicle crashes. About 70 percent of these pedestrian fatalities occurred in urban areas. Furthermore, a majority of these crashes occurred at night.

## References

1. NHTSA (2002) *Traffic Safety Facts – Alcohol*.
2. Rubin, D.B, Shafer, J.L. and Subramanian, R. (1998) *Multiple Imputation of Missing Blood Alcohol Concentration (BAC) Values in FARS*. Report DOT-HS-808-816, National Highway Traffic Safety Administration, Department of Transportation.
3. Subramanian, R. (2002) *Transitioning to Multiple Imputation – A New Method to Impute Missing Blood Alcohol Concentration (BAC) values in FARS*.
4. Utter, D.E., Subramanian, R. and Deutermann, W. (2002) *State Alcohol Related Fatality Rates*. Report DOT-HS-809-528, National Highway Traffic Safety Administration, Department of Transportation.



## Alcohol-Related Fatalities – Q&As

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This document answers questions related to the differences between the number of alcohol-related fatalities as reported by some states and those reported by NHTSA.

### 1. Why do some states report a smaller number of alcohol-related fatalities than the number reported by NHTSA?

- A. Discrepancies may occur because NHTSA and a state may use different approaches to counting alcohol-related fatalities. The primary reason for these discrepancies is that some states include only those fatalities that occur in crashes where alcohol involvement is **known**. NHTSA, on the other hand, also includes those fatalities that occur in crashes where actual alcohol involvement is unknown, but is estimated using imputation.

### 2. What is “imputation”?

- A. Imputation, the statistical procedure of ‘filling in’ missing data with plausible values, is an effective approach to estimating missing data. Imputation is widely used by researchers whose analyses would otherwise be biased by missing data.

### 3. Are there a large number of fatal crashes where alcohol involvement is not known?

- A. Yes. On an average, in more than 50 percent of the cases, alcohol involvement, as determined by actual alcohol testing, is not known. Alcohol test results may not be known for any of several reasons: the test was given, but the results were not obtained by the Fatality Analysis Reporting System (FARS); the test was refused; FARS was unable to determine if the tests were given; or, the test was not given.

### 4. How does NHTSA “impute” alcohol involvement?

- A. Imputation, as applied by NHTSA, uses characteristics of the persons involved in the crash to predict alcohol involvement when it is **not known**. Those characteristics include police-reported drinking, age, sex, restraint-use, type of crash, time of day, and driver of striking or struck vehicle.

### 5. How does NHTSA count alcohol-related fatalities?

- A. NHTSA counts a fatality as alcohol related if it occurs in a crash where any of the drivers, pedestrians or pedalcyclists involved has a Blood Alcohol Concentration (BAC) of 0.01 or more. BAC is the grams of alcohol per deciliter of blood (g/dl). NHTSA determines a fatality to be alcohol related based on known BACs in the FARS as well as imputed BACs when an alcohol test result is not reported.



**6. What is the disadvantage of not imputing alcohol involvement?**

- A. Because alcohol test results are unknown for a large proportion of cases, reporting alcohol-related fatalities based only on those cases with known results could lead to a significant underestimate of alcohol-related fatalities. When imputation is not used, cases with unknown alcohol involvement are treated as not being alcohol related.

**7. What are the benefits of imputing alcohol involvement?**

- A. Because the reporting of alcohol test results varies widely by state, imputation provides a more meaningful way for states to assess the problem of alcohol involvement in fatal crashes and compare the extent of their problem with other states. In addition, because NHTSA has applied imputation back to 1982 data, using the NHTSA estimates enables a state to perform a consistent assessment of its progress as well as to better allocate funds to impaired driving programs. Without imputation, the wide variation in a state's year-to-year reporting of alcohol involvement could produce a less consistent assessment of progress.

**8. Are there any other reasons why NHTSA's estimates of alcohol-related fatalities may differ from those reported by some states?**

- A. Yes. Other reasons that a state estimate of alcohol-related fatalities would differ from NHTSA's estimate include: the state may exclude fatalities that occur in some jurisdictions; the state may count only fatalities in crashes with an alcohol involved driver; the state may use an alcohol threshold other than 0.01 g/dl for counting alcohol related fatalities; or, the state may use data that has not yet been reported to FARS. While these definitional differences may cause a discrepancy in some states, the principal difference is whether or not imputation is used.

**9. How could estimates of alcohol-related fatalities be improved?**

- A. Data are most reliable when they are known. Consequently, if states tested all drivers involved in fatal crashes (killed *and* surviving) as well as improved the reporting of alcohol (BAC) test results to FARS, improved estimates of alcohol-related fatalities could be obtained.

*More information about the methodology to impute missing BAC test results can be found in the following report located on NCSA's web site:*

<http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2002/809-403.pdf>

*Additional information about imputation and Statistics on alcohol-related fatalities can be found at:*

<http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/AvailInf.html>



## Glossary

### Actively Involved Persons

These include all drivers or nonoccupants involved in a fatal crash. Nonoccupants include pedestrians and pedalcyclists. The term “actively-involved” qualifies persons whose actions and characteristics are significant determinants of the crash.

### Alcohol Involvement

Alcohol involvement is observed in a crash if any of the drivers or non-occupants in the crash had a BAC of 0.01 or above.

Alcohol involvement with respect to a driver or non-occupant is defined when the driver or non-occupant had a BAC of 0.01 or above.

### Alcohol Related Crashes

A Crash is said to be alcohol-related if any one of the actively-involved persons in a police-reported fatal traffic crash had a BAC of 0.01 g/dl or greater (0.01+).

### Alcohol Related Fatalities

A fatality is said to be alcohol-related if it occurred in a crash where any one of the actively-involved persons in the crash had a BAC of 0.01 g/dl or greater.

### Any Alcohol

A positive BAC value (BAC=0.01+) for any driver or nonoccupant in the crash.

### ARF

Annual Report File of the Fatality Analysis Reporting System. A compilation of preliminary data on fatal motor vehicle traffic crashes each year in the U.S.

### BAC

The Blood Alcohol Concentration (BAC) that is determined either by police-administered tests on surviving persons or from the medical records of fatally-injured persons. BAC is usually measured in grams per deciliter (g/dl) of blood and plausible values in FARS range from 0.00 to 0.94+ g/dl.

### Crash BAC

The highest BAC among all the actively-involved persons in the crash. For example, in a crash involving a vehicle and a pedestrian, if the driver of the vehicle had a BAC of 0.01 g/dl and the pedestrian had a BAC of 0.11 g/dl, the Crash BAC is 0.11 g/dl.

### Discriminant Analysis

A multivariate statistical technique for estimating linear functions of variables, and using these linear functions to calculate the (posterior) probability to each of several mutually exclusive groups.

### Driver BAC

The BAC of any driver in a crash.

### Had Alcohol

BAC of 0.01 or above.

### Imputation

A procedure used to fill in missing data using statistical procedures. These procedures use the cases with known BAC values to learn about the variables that show significant relationship with the extent of BAC. This knowledge is in turn used on the characteristics of cases with missing BAC to “estimate” a value of BAC.

### Impairment (*Impaired*)

For the purposes of this document, a person is said to be impaired if his or her BAC is between 0.01 and 0.07 g/dl (0.01-0.07).

### Injury Severity

Presented as fatal or surviving. Any injury code other than fatal is treated as surviving.

### Intoxication (Intoxicated)

For the purposes of this document, a person is said to be intoxicated if his or her BAC is 0.08 g/dl or greater (0.08+).

### Multiple Imputation

A peer-reviewed, well-accepted statistical procedure to estimate missing BAC. Each missing BAC is replaced with “multiple” BAC values which are then combined to estimate extent of alcohol involvement. Enables reporting of errors, confidence intervals, etc.

## Nonoccupant

Any person involved in a crash who is not the occupant of a motor vehicle. Pedestrians, pedal-cyclists, persons on roller-blades, skateboards, etc., are nonoccupants.

## Person BAC

The BAC of a driver or a non-occupant.

## Prior DWI Convictions

Counts prior alcohol/drug convictions within three years from crash date

## Recidivism

The tendency to repeatedly relapse into a criminal or delinquent habit such as Driving While Intoxicated (DWI).

## Rural/Urban

Land Use based on Federal Highway Administration classification.

## Weekday

From 6 a.m. Monday to 5:59 p.m. Friday.

## Weekend

From 6 p.m. Friday to 5:59 a.m. Monday.

## With Alcohol

BAC of 0.01 or above.

DOT HS 809 822  
January 2005



National Highway Traffic Safety Administration's  
National Center for Statistics and Analysis